

TRI CHLORO ETHYLENE (TCE)

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SECTION 1: IDENTIFICATION

1.1 GHS Product identifier:

TRI CHLORO ETHYLENE (TCE)
Trichloroethene; Ethylene trichloride
CAS: 79-01-6

Other means of identification:

Not relevant

1.2 Recommended use of the chemical and restrictions on use:

Relevant uses: Metal degreasing/cleaning solvent, extraction solvent, chemical intermediate. For industrial user only.
Uses advised against: All uses not specified in this section or in section 7.3.

1.3 Supplier's details:

SURAJ CHEMICALS
No 92, Govindappa Naicken Street, Shiva Complex, Chennai – 600001, Tamil Nadu, India
Tel: +91 - 7092722822, +91 - 9840284032 / +91 - 44 - 25393652, 42130281
Email: sales@surajchemicals.com | Website: www.surajchemicals.com
GST No: 33ACEPV8190L1ZZ

1.4 Emergency phone number:

Emergency Contact No: +91 - 7092722822, +91 - 9840284032

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:

GHS:
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Carc. 1B	Carcinogenicity, Category 1B, H350
Muta. 2	Germ cell mutagenicity, Category 2, H341
Eye Irrit. 2	Eye irritation, Category 2, H319
Skin Irrit. 2	Skin irritation, Category 2, H315
STOT SE 3	Narcotic effects, single exposure, Category 3, H336
Aquatic Chronic 3	Hazardous to the aquatic environment, chronic hazard, Category 3, H412

2.2 GHS label elements, including precautionary statements:

GHS: Danger

Hazard statements:

Carc. 1B: H350 – May cause cancer.
Muta. 2: H341 – Suspected of causing genetic defects.
Eye Irrit. 2: H319 – Causes serious eye irritation.
Skin Irrit. 2: H315 – Causes skin irritation.
STOT SE 3: H336 – May cause drowsiness or dizziness.
Aquatic Chronic 3: H412 – Harmful to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection.
P302+P352: IF ON SKIN: Wash with plenty of water.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313: IF exposed or concerned: Get medical advice/attention.
P403+P233: Store in a well-ventilated place. Keep container tightly closed.
P405: Store locked up.
P501: Dispose of the contents/containers in accordance with regulations on hazardous waste.

2.3 Other hazards which do not result in classification:

Repeated or prolonged overexposure may affect the central nervous system, liver and kidneys. Thermal decomposition (contact with hot surfaces, flames or UV light) can generate phosgene, hydrogen chloride and other toxic gases – see section 10.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances:

Chemical description: Trichloroethylene (technical grade)
In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 79-01-6	Trichloroethylene — Carc. 1B: H350; Muta. 2: H341; Eye Irrit. 2: H319; Skin Irrit. 2: H315; STOT SE 3: H336; Aquatic Chronic 3: H412 – Danger	≥ 99.0%

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

3.2 Mixtures:

Non-applicable

SECTION 4: FIRST AID MEASURES

4.1 Description of necessary first-aid measures:
Request medical assistance immediately, showing the SDS of this product.

By inhalation:
Remove the person affected from the area of exposure, provide fresh air and keep at rest. High vapour concentrations may cause headache, dizziness, drowsiness and cardiac irregularities. Seek medical attention.

By skin contact:
Remove contaminated clothing and footwear, wash skin thoroughly with plenty of water and soap. Prolonged/repeated contact may cause defatting and dermatitis. Seek medical attention if irritation persists.

By eye contact:
Rinse eyes thoroughly with lukewarm water for at least 15 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Seek medical attention.

By ingestion/aspiration:
Do not induce vomiting (risk of aspiration into lungs). Rinse mouth with water. If conscious, give water to drink. Seek immediate medical attention.

4.2 Most important symptoms/effects, acute and delayed:
Acute and delayed effects are indicated in sections 2 and 11.

4.3 Indication of immediate medical attention and special treatment needed, if necessary:
Avoid administration of adrenaline/epinephrine-type drugs (risk of cardiac sensitisation). Treat symptomatically.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing media:
Suitable: Dry chemical powder, carbon dioxide, foam, water spray/fog for cooling containers
Unsuitable: Do not use a solid water jet

5.2 Specific hazards arising from the chemical:
Non-flammable under normal conditions, but vapours may form combustible mixtures with air at elevated temperatures. Thermal decomposition, or contact with flames/hot surfaces/UV light, produces phosgene, hydrogen chloride, chlorine and carbon monoxide.

5.3 Special protective actions for fire-fighters:
Evacuate all non-essential personnel. Intervention only by capable personnel who are trained and aware of the hazards of the product. In all cases wear self-contained breathing apparatus. When intervention in close proximity, wear full protective chemical-resistant suit. After intervention, proceed to clean the equipment (take a shower, remove clothing carefully, clean and check).

Additional provisions:
Cool fire-exposed containers with water spray from a safe distance. Approach from upwind. Contain fire-fighting water to prevent environmental release.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:
For non-emergency personnel:
Isolate leaks provided there is no additional risk for the people performing this task. Personal protection equipment must be used against potential contact with the spilt product (see section 8). Evacuate the area and keep out those who do not have protection.

For emergency responders:
Wear protective equipment. Keep unprotected persons away. See section 8.

6.2 Environmental precautions:
Avoid release to drains, watercourses or soil. Contain spillage with inert absorbent material. Notify the relevant authority in case of significant environmental release.

6.3 Methods and materials for containment and cleaning up:
Absorb with inert non-combustible absorbent material (sand, vermiculite) and place in a labelled, closed container for disposal. Ventilate the area after clean-up. Do not allow to enter sewers/waterways.

6.4 Reference to other sections:
See sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

- 7.1 Precautions for safe handling:**
A. General precautions for safe use:
Use only in well-ventilated areas with local exhaust ventilation. Avoid inhalation of vapours and prolonged skin contact. Keep away from open flames, hot surfaces and UV/strong light sources (risk of toxic decomposition products). Do not use compressed air for transfer.
- B. Technical recommendations for the prevention of fires and explosions:**
Store and handle away from strong oxidizing agents, strong alkalis and reactive light metals (aluminium, magnesium, titanium powders). Keep containers tightly closed when not in use.
- C. Technical recommendations on general occupational hygiene:**
Do not eat or drink during the process; wash hands afterwards with suitable cleaning products.
- D. Technical recommendations to prevent environmental risks:**
Provide tight electrical equipment well protected against corrosion. Avoid atmospheric emissions. Warn people about the dangers of the product. Follow the protective measures given in the exposure controls/personal protection section. In industrial installations, apply the rules for the prevention of major accidents (consult an expert).

7.2 Conditions for safe storage, including any incompatibilities:

A. Specific storage requirements:

Minimum Temp.	5°C
Maximum Temp.	30°C, protected from light
Maximum time	24 Months in original sealed packaging

B. General conditions for storage:
Store in a cool, dry, well-ventilated place away from direct sunlight, heat sources and incompatible materials, in tightly closed containers (typically stabilised with amine/epoxide inhibitors to prevent decomposition). For additional information see subsection 10.5.

7.3 Specific end use(s):
Except for the instructions already specified, it is not necessary to provide any special recommendation regarding the uses of this product.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters:
Substances whose occupational exposure limits have to be assessed in the workplace, per the Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987):

Identification	Occupational Exposure Limit Type	Value
Trichloroethylene CAS: 79-01-6	ACGIH TLV – TWA (8 hrs)	10 ppm
Trichloroethylene CAS: 79-01-6	ACGIH TLV – STEL (15 min)	25 ppm

8.2 Appropriate engineering controls:
It is recommended to use localized extraction in the work area as a collective protection measure to avoid exceeding occupational exposure limits, in addition to individual protective equipment (PPE) as needed. Consult the manufacturer's information leaflet for storage, use, cleaning and maintenance of PPE.

- B. Respiratory protection:**
Where ventilation is inadequate, use an organic vapour cartridge respirator; use self-contained breathing apparatus for high concentrations or confined spaces.
- C. Specific protection for the hands:**
Chemical-resistant gloves (e.g. Viton®, laminated barrier film). Note: PVC, nitrile and neoprene offer limited breakthrough time against chlorinated solvents.
- D. Eye and face protection:**
Chemical splash goggles.
- E. Bodily protection:**
Chemical-resistant apron/clothing for prolonged or repeated contact.
- F. Additional emergency measures:**
Emergency shower (ANSI Z358-1, ISO 3864-1:2011, ISO 3864-4:2011) and eyewash stations (DIN 12 899, ISO 3864-1:2011, ISO 3864-4:2011) should be available.

Environmental exposure controls:
Avoid environmental spillage of both the product and its container. See subsection 7.1.D.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance	
Physical state at 20°C	Liquid
Appearance	Clear, mobile liquid
Color	Colorless
Odor	Sweet, chloroform-like
Odour threshold	~20–100 ppm (approx.)
Volatility	
Boiling point at atmospheric pressure	87°C
Vapour pressure at 20°C	~7.8 kPa (58 mmHg)
Evaporation rate (n-BuAc = 1)	High (~7)
Product Description	
Density / Relative density at 20°C	1.46 g/cm³
Dynamic / Kinematic viscosity at 20°C	~0.55 mPa·s
Concentration	≥ 99.0%
pH	Not applicable (non-aqueous)
Vapour density (air = 1)	~4.5
Partition coefficient n-octanol/water (log Pow)	2.42
Solubility in water at 20°C	~1.3 g/L
Decomposition temperature	Not established (decomposes on contact with flames/hot metal – see section 10)
Melting point/freezing point	-73°C
Flammability	
Flash Point	Non-flammable under normal conditions of use (no sustained combustion)
Flammability (solid, gas)	Non-applicable (liquid)
Autoignition temperature	~410°C
Lower / Upper flammability limit	~8% / 10.5% (vol. in air, narrow range, does not sustain flame propagation in open air)
Particle Characteristics	
Median equivalent diameter	Non-applicable (liquid)

Values are typical literature/reference values for this substance and may vary slightly by batch.

9.2 Other information:

Explosive properties	Not classified as explosive
Oxidising properties	Not an oxidizer
Corrosive to metals	May corrode aluminium and other reactive light metals in the presence of moisture
Heat of combustion	Not relevant (non-flammable)
Surface tension at 20°C	~29.5 mN/m
Refraction index	~1.477

SECTION 10: STABILITY AND REACTIVITY

- 10.1 Reactivity:**
Reacts with strong oxidizing agents, strong alkalis/caustics (can form dichloroacetylene, a spontaneously flammable and toxic gas) and chemically active light metals in powder form (aluminium, magnesium, titanium).
- 10.2 Chemical stability:**
Chemically stable under the indicated conditions of storage, handling and use when adequately stabilised (inhibited) and protected from light and moisture.
- 10.3 Possibility of hazardous reactions:**
Contact with hot surfaces, open flames or UV light can generate phosgene, hydrogen chloride and chlorine. Reaction with strong alkalis or reactive metals can be vigorous/exothermic.
- 10.4 Conditions to avoid:**

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Avoid prolonged air exposure without stabiliser	Avoid open flames/hot surfaces	Avoid prolonged direct exposure (photodecomposition)	Avoid contact with moisture in presence of light metals

10.5 Incompatible materials:

Strong Oxidizing Agents	Strong Alkalis/Caustics	Reactive Light Metals
Avoid contact	Avoid contact – risk of dichloroacetylene formation	Avoid contact with Al, Mg, Ti powders

- 10.6 Hazardous decomposition products:**
Phosgene, hydrogen chloride, chlorine and carbon monoxide on thermal decomposition/combustion.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:
In case of exposure that is repetitive, prolonged, or at concentrations higher than the recommended occupational exposure limits, adverse health effects may result depending on the means of exposure:

A. Ingestion (acute effect):
May cause gastrointestinal irritation, nausea and central nervous system depression. Not classified under acute oral toxicity criteria.

B. Inhalation (acute effect):
Vapours cause CNS depression (headache, dizziness, drowsiness, incoordination) and may sensitise the heart to catecholamines (risk of cardiac arrhythmia). Not classified as an acute inhalation toxicity hazard at typical exposure levels.

C. Contact with skin and eyes (acute effect):
Causes skin and serious eye irritation; prolonged/repeated skin contact may cause defatting dermatitis.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity):
Classified Carc. 1B (H350) and Muta. 2 (H341) under GHS/CLP. IARC: Group 1 – carcinogenic to humans (kidney cancer; association with liver cancer and non-Hodgkin lymphoma).

E. Sensitizing effects:
Classification criteria for respiratory or skin sensitisation are not met based on available data.

F. Specific target organ toxicity (STOT) – single exposure:
May cause drowsiness or dizziness (H336) due to narcotic vapour effects at elevated concentrations.

G. Specific target organ toxicity (STOT) – repeated exposure:
Repeated/prolonged overexposure has been associated with effects on the liver, kidneys and central nervous system (occupational epidemiology); not formally classified under GHS repeated-dose criteria at the concentrations supplied.

H. Aspiration hazard:
May be harmful if aspirated into the lungs following ingestion/vomiting; classification criteria for aspiration hazard are not formally met based on available data.

Product-specific toxicological information:

Identification	Acute Toxicity	Genus
Trichloroethylene CAS: 79-01-6	LD50 oral: 4920 mg/kg	Rat
	LD50 dermal: >20000 mg/kg	Rabbit
	LC50 inhalation: ~8000 ppm (4h)	Rat

SECTION 12: ECOLOGICAL INFORMATION

Classified as hazardous to the aquatic environment, chronic Category 3.

12.1 Toxicity:

Identification	Acute Toxicity	Species	Genus
Trichloroethylene CAS: 79-01-6	LC50: ~40.7 mg/L (96h)	Pimephales promelas	Fish
	EC50: ~18 mg/L (48h)	Daphnia magna	Crustacean

12.2 Persistence and degradability:

Not readily biodegradable under standard aerobic test conditions; degrades relatively rapidly in the atmosphere by photo-oxidation and volatilises quickly from water.

12.3 Bioaccumulative potential:

Low bioaccumulation potential (log Pow 2.42; BCF estimated ~17).

12.4 Mobility in soil:

Koc	Henry	Dry Soil	Moist Soil
~87 (moderate mobility)	~9.9×10 ⁻³ atm·m³/mol (volatile)	Partially volatilises	Mobile, may leach to groundwater

12.5 Results of PBT and vPvB assessment:

This substance does not meet the PBT/vPvB criteria of Annex XIII (not persistent/bioaccumulative; classified for human carcinogenicity separately – see section 11).

12.6 Other adverse effects:

Not described

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Disposal methods:

Do not discharge to drains, watercourses or soil. Dispose of via a licensed hazardous waste contractor by incineration with acid-gas scrubbing, in accordance with local regulations. For packaging: drain thoroughly; do not reuse empty containers for other purposes.
Refer to national and local regulations on waste management, including the Hazardous and Other Wastes (Management and Transboundary Movement) Rules.

SECTION 14: TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR 2023 / RID 2023):

14.1 UN number	UN1710
14.2 UN proper shipping name	TRICHLOROETHYLENE
14.3 Transport hazard class(es)	6.1
14.4 Packing group	III
14.5 Environmental hazard	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by sea (IMDG 41-22):

14.1 UN number	UN1710
14.2 UN proper shipping name	TRICHLOROETHYLENE
14.3 Transport hazard class(es)	6.1
14.4 Packing group	III
14.5 Marine pollutant	No
14.6 Special precautions for user	EmS Codes: F-A, S-P Limited quantities: 5 L Segregation group: Not relevant
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by air (IATA/ICAO 2024):

14.1 UN number	UN1710
14.2 UN proper shipping name	TRICHLOROETHYLENE
14.3 Transport hazard class(es)	6.1
14.4 Packing group	III
14.5 Environmental hazard	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations specific for the product in question:

It is recommended to use the information included in this safety data sheet as data used in a risk evaluation of local circumstances, in order to establish the necessary risk prevention measures for the manipulation, use, storage and disposal of this product.

Other legislation:

- Manufacture, Storage and Import of Hazardous Chemicals Rules 1989
- The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)
- The Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996
- Public Liability Insurance Act, 1991

SECTION 16: OTHER INFORMATION

Legislation related to safety data sheets:

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3:

- H350: May cause cancer.
- H341: Suspected of causing genetic defects.
- H319: Causes serious eye irritation.
- H315: Causes skin irritation.
- H336: May cause drowsiness or dizziness.
- H412: Harmful to aquatic life with long lasting effects.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training:

Minimal training is recommended to prevent industrial risks for staff using this product, in order to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

Principal bibliographical sources:

PubChem (National Library of Medicine); European Chemicals Agency (ECHA) classification and labelling inventory; United Nations Economic Commission for Europe (UNECE) Model Regulations; ACGIH Threshold Limit Values. IARC Monographs (Group 1 classification).

Abbreviations and acronyms:

ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ICAO: International Civil Aviation Organisation | COD: Chemical Oxygen Demand | BOD5: 5-day biochemical oxygen demand | BCF: Bioconcentration factor | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | Log-POW: Octanol-water partition coefficient | Koc: Partition coefficient of organic carbon | IARC: International Agency for Research on Cancer

The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

END OF SAFETY DATA SHEET